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BIG LIFT AT NSW BLAST FURNACE RELINE PROJECT

Planning for the relining of the No.6 Blast Furnace at Australian steel manufacturer BlueScope's Port Kembla Steelworks in Wollongong, New South Wales - 80km south of Sydney - began in 2022 when initial approvals were granted, with work starting in August and taking three years to complete.

One aspect of the project involved the removal of the 'downcomer', the large pipe that transports gas or steam from the top of the furnace to the lower levels where the reactions take place. The downcomer on this furnace is 54 metres long and has a total weight of around 170 tonnes. Once removed it was shipped off site for a complete overhaul and will then be reinstalled when completed.

To carry out this and other lifts BlueScope commissioned Marr Contracting which supplied its 330 tonne Favelle Favco M2480D heavy lift luffing jib tower crane. The crane was installed on an 85 metre tower installed on a 7.5 by 7.5 metre piled foundation and rigged with 94 metres of boom/luffing jib.

The crane lifted the pipe free from the furnace and lowered it to the ground where a 400 tonne Grove GMK6500-1 All Terrain crane was used to 'tail out' the load to the horizontal so that it could be placed on supports to be transported to the workshops for relining. The tower crane is also being used to carry out a number of other lifts typically averaging between 30 and 35 tonnes as well as plenty of day to day smaller lifts.

The downcomer lift was engineered and planned by the BlueScope Reline Project team in collaboration with Marr, with the tower crane selected as a simpler and safer alternative to the traditional method of using a large heavy lift crawler crane, which it used on its No 5 furnace reline. It required a great deal more space and a good deal off complexity, all of which the company was keen to avoid on this more congested project.

Project director, Justin Reed said: "Marr's team have challenged our traditional thinking by enabling large sections of equipment that were previously maintained in situ to be lifted to ground for repairs or replacement."

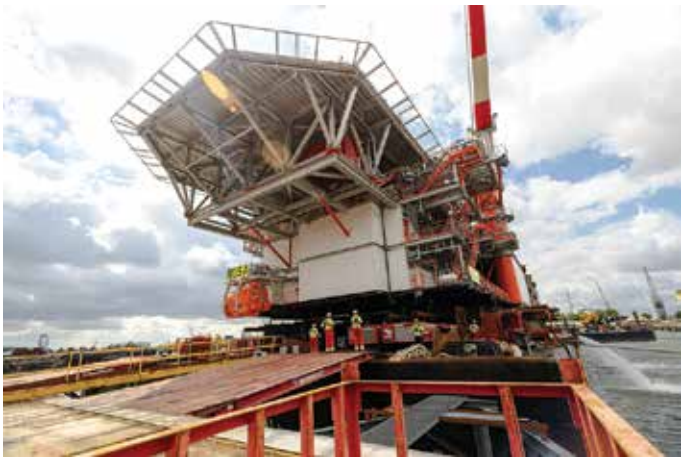
"The capability and capacity of the M2480D is a true game changer for our project. At vertical industrial sites like a blast furnace, we have always wished there was a 'skyhook' that could deliver a lift at any point on the plant, and now we have a solution with significant lifting capacity."

Marr's managing director Simon Marr added: "By engaging us early in the planning stages, BlueScope's team unlocked the possibility to develop a simple solution that helped to reduce complexity and secure the tight construction program."

The Port Kembla Steelworks date back to 1926 when construction began. The first iron ore arrived in July 1928 aboard the BHP ship Iron Warrior, with the blast furnace fired up in August 1928. The plant was sufficiently successful that the owners shut down the blast furnace at the Lithgow steel plant north west of Sydney, with Port Kembla supplying it with its iron. Kembla eventually took over the entire steel making process and Lithgow was closed in 1931. The No 6BF was 'blown'/first fired up in May 1996.

BlueScope Steel came into being when BHP Billiton spun off its steel assets in July 2002, originally as BHP Steel, but was renamed BlueScope in November 2003 and is quoted on the Australian Stock Exchange (ASX). Today it is one of Australia's leading steel manufacturers and a global leader in finished and semi-finished steel products. The steelworks currently operates as an integrated iron and steel plant and is co-located with hot rolling mills for plate and coil with adjacent manufacturing facilities for cold rolling, coated products, flat products and welded beams

The refurbished downcomer will be reinstalled in another major lifting operation using Marr's M2480D later this year with 6BF due to be fully recommissioned by mid-2026.



FIRST ELECTRIC OFFSHORE GAS PLATFORM LOAD-OUT

The N05-A platform is the first offshore gas platform in the Dutch North Sea to be fully electrified, using an electric transformer powered entirely from the nearby 113MW Riffgat offshore wind farm, reducing carbon emissions by more than 85 percent. When fully operational the unmanned platform will also emit less noise and light pollution as well as minimising transport movements during operations.

The platform is part of the GEMS (Gateway to the Ems) project which began around six years ago, tasked with the development of gas fields including N05-A in the waters on the border of the Netherlands and Germany.

Mammoet was approached by HSM Offshore to load out two components - the 3,050 tonne N05-A topside and 3,150 tonne jacket - onto a barge at HSM's quayside fabrication facility in Schiedam, Rotterdam. The offshore shipping and installation were managed by One-Dyas, the owner of the platform.

ASSEMBLY AND WEIGHING

Mammoet's engineering solution allowed the jacket to be assembled more efficiently, close to its installation location and critically reduced the lead time for construction. The jacket was fabricated and assembled in two parts, so the first phase involved bringing them together. The top section of the jacket was raised using two sheerleg cranes, creating the space underneath for the bottom section to be driven under so that the two parts could be joined.

Self-Propelled Modular Transporters (SPMTs) were positioned beneath the fully assembled structure so that it could be moved to quayside, where a Liebherr pedestal crane was installed using an All Terrain crane.

The team then used sixteen, 300 tonne load cells on the SPMT to confirm the final weights of each of the two structures along with their centre of gravity. The actual weights were very close to the original predictions.

SHIPPING SCHEDULE

One of the biggest challenges of the project was the load-out phase. Normally for loadouts of this type, a barge would receive either a topside or a jacket - not both together. However, for this project both structures needed to be loaded out onto the same vessel to shorten the overall schedule.

Due to the overall weight the barge had to be ballasted to keep it level with the quay as the

loads were driven aboard. This involved pumping water out of one side of the barge and pumping water into the other side. This was achieved using 20 ballast pumps which when running at the same time can pump 20 million litres of water an hour.

"The mooring was quite critical," said project manager Sven Segeren. "Normally, we would use a configuration of winches to moor and stabilise the vessel, but that wasn't possible because of the force of the considerable loads. The loads on the winches were too high and the bollards not strong enough, so a small spud leg barge was used to secure the vessel and keep it in position prior to, during and after load-out."

It took five days to prepare the main barge, while the load-out operation of the jacket foundation and topside was completed in just two days.

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BUILDING BRIDGES IN DROITWICH

Removing and installing canal footbridges is no easy task, with confined work areas due to obstacles such as trees and buildings. So, when contractor Griffiths Civil Engineering was tasked with replacing two aging bridges on the Droitwich Canals, near Worcester in the UK, they were obliged to make the lifts from the water and employed marine engineering and maintenance specialist The Rothen Group (TRG) to carry out the work.

Flowing through the spa town of the same name, the Droitwich Canals are thickly lined with trees and hedges. Reopened in 2011, the canals - consisting of the Droitwich Barge Canal and Droitwich Junction Canal - have become very popular with those wanting to navigate the picturesque Mid-Worcestershire Ring.

The canal's popularity requires regular upkeep including the two well used 18 metre long timber footbridges. The bridges span the Droitwich Canal and the River Salwarpe, connecting the main A38 road with a housing estate, with the King George Playing Fields in between.

TAKING DOWN THE TIMBER

Thomas Roberts, Griffiths site manager said: "Dismantling and replacing bridges is undoubtedly difficult and requires a lot of planning, especially when it crosses water and access is a challenge. There was no choice but to remove the old bridges from the canal itself, so we knew specialist equipment and knowledge would be needed."

Griffiths chose TRG for its experience and wide range of specialist equipment. It provided an eight metre jack up crane pontoon, equipped with an HMF articulated boom crane, capable of handling two tonnes at a 12 metres radius. The barge was also able to reach both bridges and the pontoon's jack legs helped create a stable base for carrying out the lifts.

"Dismantling the old bridges proved a challenge, as it quickly became apparent that the old wood had rotted," said founder Ian Rothen, "We were able to meet this challenge using scaffold towers mounted on the pontoon and extra slings to carry out the first stage of the work."

HELP FROM THE HOPPER

The old bridge sections and scrap material were loaded onto a 21 metre historic transport barge or hopper, for disposal off-site. This hopper was then used to bring in the new bridge spans. New ramps were also lifted into place followed by the handrails. The project took 11 weeks to complete, although the bridge installation lifts took just two days each.

"While we are known for traditional canal bridge lifts, these footbridges were some of the biggest we had ever erected," said Rothen. "Our largest boat is 21 metres, so considering the bridge spans were 18 metres long, the whole project was very tight. However, it was completed without a hitch."

At the end of last year TRG invested £500,000 to upgrade the cranes on 17 of its boats. Working with Danish loader crane manufacturer HMF, TRG added eight different sized cranes to its fleet, ranging from six tonne/metres to 50 tonne/metres.

The barge crane fleet is used for jobs such as bank protection, piling, dredging and changing lock gates, with more than 50 such projects completed over the past 12 months. The new loader cranes are equipped with clamshell attachments and remote controls, essential for lock gate installation.


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CUBE JACKS AND EVO SYSTEM

Enerpac manufactures a wide range of alternative lifting equipment including hydraulic gantries, strand jacks, jack-up, skidding and trolley systems for heavy lift projects. The following projects used its cube jacks and the EVO synchronous jack-down system.

BOEKHORSTBRUG BRIDGE RENOVATION

Dutch infrastructure company Hollandia Services was tasked with the renovation of the aging Boekhorstbrug table bridge in the Hague, the Netherlands. The bridge had to be removed for the refurbishment work to be carried out away from the site in order to minimise disruption to the local community. The work included the complete replacement of its electrical and hydraulic systems as well as the road surface and paint finish.

Hollandia would normally have used an All Terrain or barge crane for this type of lift and move, however for this job, neither of these options were possible. Hollandia's solution therefore involved jacking up the 10.8 metre by 6.3 metre bridge using Enerpac cube jacks then driving a flatbed trailer equipped with a slew ring underneath. The bridge was then lowered onto the slew ring at a height of 2.3 metres, rotated 90 degrees, making it possible for the bridge to be transported by road through nearby residential areas to the wharf in Krimpen aan den IJssel.

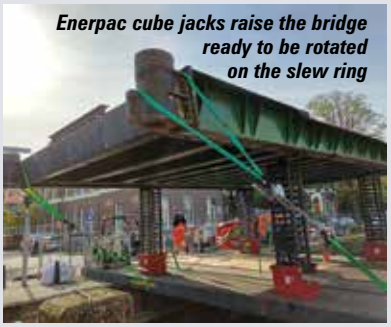
"Our challenge was how to lift the bridge to a height of three metres and lower it back down again in a short space of time and the Enerpac SCJ-100 cube jacks provided the perfect solution," said Emiel Maas of Hollandia Services.

The SCJ-Series cube jack uses a base lifting frame and self-aligning lightweight steel cribbing blocks to provide a high capacity and stable lift, offering a safer, more controlled and efficient alternative to climbing jacks with timber cribbing. The four cube jacks were connected together via a split flow pump to provide synchronous lifting and lowering of the bridge.

Bridge deck rotation completed, Enerpac cube jacks lower the bridge onto the flatbed trailer

"The cube jacks took just 20 minutes to jack up the bridge from a height of 750mm to almost three metres, and then lowered to 2.3 metre high ring. After rotating the bridge, the cube jacks were used to raise the bridge back up three metres, to rest on the stands on the trailer. For the reinstallation we simply reversed the process."

Photos: Woodside Energy



Enerpac cube jacks raise the bridge ready to be rotated on the slew ring

Using Enerpac cube jacks to reinstall the refurbished bridge

TRIPLE COMPRESSOR INSTALLATION

Three 3,000 tonne LG compressors have been installed at the Pluto LNG onshore facility near Karratha in Western Australia using an Enerpac EVO System. Alevro - a joint venture between Australian engineering services provider Monadelphous and Italian heavy lift specialist Fagioli - used the Enerpac system for the synchronous jack down of the three compressors.

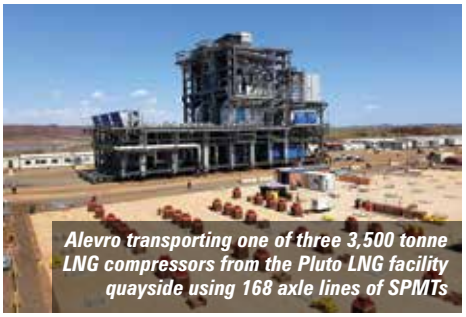
Alevro transported the 3,600 tonne compressors - which measure 63 metres long by 30 metres wide and 30 metres high - from the quayside to the prepared on-site foundations using a 168 axle line SPMT (Self-Propelled Modular Transporter) using the Enerpac EVO System to lower them onto the foundations.

The sheer size and weight of compressors meant that detailed pre-planning was critical for the project. The site was prepared with a ground level concrete slab with an array of anchor points. 44 Enerpac climbing jacks were suitably positioned with each stack standing at 1.2 metres. The stacks were topped by 500mm of climbing jack frames, each holding Enerpac 250 tonne jacks. The entire jack-down process was powered by two Enerpac EVO power packs, each operating 24 jacks on 12 hydraulic lines with a power requirement of only 7.5kW. Custom designed frames were made for the jacking process in order to avoid clashes with the module structure.

Operations manager Massimiliano Vettrici said: "Testing the jack-down system was crucial in building confidence for the next stage of the compressor installation, where the Enerpac cylinders would bear the full weight of the compressor module. Additionally, we paid particular attention to module alignment while on SPMTs, as we did not anticipate any movement during the lowering phase, given the numerous jacking points."

"The load transfer from SPMTs to climbing jacks utilised the Enerpac EVO 'tilting mode' to align the module onto the SPMTs hydraulic bed. The entire jack-down operation went very smoothly. The successful installation of all compressor modules has now established the framework for future jack-downs."

When completed the facility will process gas from the Scarborough natural gas field located in the Carnarvon Basin 375km off the coast of Western Australia.



Alevro transporting one of three 3,500 tonne LNG compressors from the Pluto LNG facility quayside using 168 axle lines of SPMTs

One of the Enerpac EVO power packs used to operate 24 jacks to lower the load onto pre-prepared foundations

Positioning the LNG compressor ready for jack-down onto the foundations

SARENS SGC-90 IN VIETNAM

Belgian heavy lift specialist Sarens' 1,650 tonne all electric SGC-90 heavy lift ring crane is working at the PTSC Yard in Vung Tau, Vietnam, where it is lifting and assembling 33 foundation jackets for offshore wind turbines on Taiwan's 900MW capacity Ørsted's Greater Changhua Offshore wind project in the Taiwan Strait.

The crane has been configured with a 130 metre boom to handle lower jacket sections weighing 540 tonnes and upper sections of 700 tonnes, carrying out two lifts per jacket. The multi legged steel structures will be installed on the seabed to support the wind turbines.

TANDEM BLADE REPLACEMENT LIFT

Crane and transport contractor Grúas Ibarrondo used two Liebherr All Terrain cranes - a 750 tonne LTM 1750-9.1 and the first 650 tonne LTM 1650-8.1 in the country - at the Experimental Cener-Alaiz wind farm in Navarra, Spain, to replace three rotor blades on a wind turbine.

The original blades from the SG 4.X turbine were 64.5 metres long and weighed 24 tonnes, while the new blades are 71.5 metres but lighter at 22.5 tonnes each. The cranes are working in tandem with hook heights of 130 metres and are part of preventative maintenance service contract.

MODULIFT AT HINKLEY POINT

Spreader beams from specialist lifting equipment manufacturer Modulift are being used to lift mechanical, electrical and HVAC components at Hinkley Point C nuclear power station in the UK.

In a recent operation carried out by MEH Alliance - responsible for managing the installation of mechanical, electrical, and HVAC systems on the project - a Modulift MOD 12 Spreader Beam was used to lift and position a 5.4 tonne cooling pump, a key component of the Reactor Cavity and Spent Fuel Pond Cooling System. The pump was hoisted and skated into its operational room, ready for installation.

The MOD 12 spreader beam can be configured for various spans, making it ideal for repetitive, but varying lifts. MEH Alliance is responsible for installing more than 4,870 items, 366km of pipework and 7,500km of electrical cabling at the power station.

DURHAM LIFTING ADDS MULTISEC BEAM

The UK's Durham Lifting has added a Multisec Multi-Point 34T Heavy Lift Beam with a 34 tonne capacity and 10.5 metre span, to its rental fleet.

The beam has been designed to provide a versatile solution for a wide range of lifting applications. One of its main features is its ability to maintain full load capacity, even at 30 and 45 degree sling to vertical angles. The inclusion of ISO 1328 compliant forklift pockets makes transportation and positioning on site simple and efficient.Designed with optimal lug spacing -150mm on heavy-duty beams and 250mm on lighter models - the Multisec Multi-Point beams ensure even load distribution, reducing strain on lifting equipment while improving efficiency.

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